

REMARKS

Claims 1-3 and 6-13 now stand in the application, new claims 7-13 having been added. Reconsideration of the application and allowance of all claims are respectfully requested in view of the above amendments and the following remarks.

Claims 1-3 are rejected under 35 U.S.C. §102(a) as being anticipated by Grubb et al. (WO 00/49721 A2), and claim 6 stand rejected as unpatentable over Grubb et al. These rejections are respectfully traversed.

As described at page 3 of the present application, the problem to which the present invention is directed is maintain high pumping efficiency and reduce crosstalk between pump wavelengths in a system using Raman amplification with multiple pumps. The solution presented by the invention is to manage the polarizations of the various pump signals for optimum efficiency. This concept is not addressed anywhere in the Grubb et al specification. The only issue is whether or not the claims of the present application are drafted to avoid reading on what is disclosed by or what is inherent in Grubb et al.

It is submitted that the claims distinguish over Grubb et al on at least two bases.

First, While Grubb et al does teach that the two pump wavelengths input to the polarization combiner are orthogonal, it does not discuss the relative polarizations of the pump signals as they are present in the amplifying fiber 30. Assuming that the relative polarizations are maintained in passing through the combiner 39, it is known that polarization is affected by a beam passing through a dichroic filter. Without more detailed information of the filter 38 and combiner 26, the relative polarizations of the various signals are uncertain, and it is certainly not

clear that they are maintained at a predetermined difference as is required of claim 1. And since Grubb et al lacks any discussion whatsoever about the need for or advantages in maintaining a predetermined polarization relationship of the pump beams in the fiber 30, Grubb et al cannot be considered to teach this feature.

An aspect of polarization management in the present invention involves the question of what to do when there are more than two pump beams. When there are too many pump beams, it is not physically possible for them all to be orthogonal to one another. The present inventors have discovered that the lower part of the pump wavelength band at one polarization and the upper part of the band at another polarization that is orthogonal to the polarization of the lower band. Thus, for example, wavelengths of 1429 nm, 1439 nm and 1450 nm comprise the lower band in fig. 1, and the upper band includes a single pump wavelength 1485 nm that is orthogonal to the lower band polarization. This concept of a band of pump signals co-polarized and orthogonal to a different band is certainly not suggested anywhere in Grubb et al.

Claim 1 states that the polarization of one of the pump radiation wavelengths is maintained at a predetermined difference with respect to the other pump radiation wavelengths, i.e., there are plural "other" pump radiation wavelengths. This is not taught by simply the two orthogonal input pump signals to the combiner 39 in Grubb et al.

Claims 2-3 and 6 are patentable due to their dependence on claim 1. In addition, it is noted that the multiple pump signals in at least one of the groups is inherent in claim 6 which recites three wavelengths for the lower group. In rejecting claim 6, the examiner explains the obviousness of using particular wavelengths. Applicants do not agree that the choice of

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wavelengths is obvious, but in any event that misses the fundamental point now emphasized in claim 1, i.e., there is absolutely nothing in Grubb et al which would provide guidance as to how the various wavelengths might be grouped for polarization purposes.

New claims 7-13 are patterned after claims 1-3 and 6 but claim 7 describes in more detail the maintaining of relative polarization between groups.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

An extension of time is requested, the required fee being separately authorized the the Electronic Filing System (EFS). The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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